**3GPP TSG-RAN WG3 #116 R3-223694**

E-meeting, 9-19th, May, 2022

Agenda Item: 9.1.8.1

Source: CMCC (moderator)

Title: Summary of offline discussion on Sidelink relay Corrections

Document for: Discussion

# Introduction

This contribution provides the summary of the following email discussion,

**CB: # SR1\_Corrections**

**- Whether to configure Uu RLC channel in UE CONTEXT SETUP procedure of Relay UE?**

**- Correction for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE, to define a new IE or to change ASN.1? Whether to modify the definition for NR UE Sidelink Aggregate Maximum Bit Rate IE in NG/Xn/F1?**

**- The definition of PC5 RLC channel ID, per remote UE or per relay UE? The value of maxnoofPC5RLCChannels?**

**- Whether to add a container pointing to SL-PathSwitchConfig in Path Switch Configuration IE?**

**- Whether to add PC5 low layer configuration IE in DU to CU RRC Information IE?**

**- Check other phase2/3 details**

**- Capture agreements and provide CRs if agreeable**

(CMCC - moderator)

Summary of offline disc R3-223694

Phase 1: To collect views on the proposals and try to make agreements. Please provide your feedback by **23:59 UTC Thursday May 12th  to leave more time for CRs**

Phase 2: Check the proposals made in the phase I discussion, discuss the open points and work on the CRs. Please provide your feedback by**12:00 UTC Monday May 16t**h to leave more time for working on CRs.

# For the Chairman’s Notes

**Phase II proposals:**

**Notes: The proposals are made based on majority views. 1 company has concerns on P1 and P2; 1 companies has concerns on P7; 2 companies have concerns on P9.**

**Proposal 1:Keep the tabular as it and update ASN.1 to avoid the misalignment in TS 38.413 and TS 38.423.**

**Proposal 2: Update ASN.1 as following**

{ ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }

**Proposal 3: Keep existing IE for SL-PathSwitchConfig.**

**Proposal 4: Include sl-RLC-ChannelToAddModList in DU to CU RRC Information IE.**

**Proposal 5: The explanation of maxnoofPC5RLCChannels is per remote UE or per relay UE.**

**Proposal 6: Agree the following corrections (A,C,E,F)**

**A: change undefined timer to T420 [11]**

**C: Change “Uu RLC channel” and “PC5 RLC channel” to “Uu Relay RLC channel” and “PC5 Relay RLC channel” [4] [10]**

**E: Add procedure description of “5G ProSe Authorized”, “5G ProSe UE PC5 Aggregate Maximum Bit Rate”, “5G ProSe PC5 Link Aggregate Bit Rate” [4]**

**F: Add procedure description of “Updated Remote UE Local ID”[4]**

**Proposal 7: Taking the changes for step 30 in clause 8.19.1 and step 24 in clause 8.19.2, step 20 in clause 8.19.3 in contribution [1] as baseline for CR preparation.**

**Proposal 8: Remove “During RRC connection establishment procedure of the U2N Relay UE, gNB may configure the U2N Relay UE with Uu RLC channel(s) for relaying of U2N Remote UE’s SRB0/1” in step 3 of TS 38.401 as in contribution [1].**

**Proposal 9: Remove Uu RLC channel related description and bear mapping in UE context setup procedure in TS 38.473 as in contribution [2].**

**Proposal 10: *maxnoofPC5RLCChannels* value in TS 38.473 should be 512.**

**Proposal 11: Change semantic description of Sidelink Configuration Container in TS 38.473 as contribution [11].**

**Proposal 12: Change the flowchart by terminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13 in TS 38.401.**

**Proposal 13: Change the range of Uu/PC5 RLC CH ID in TS 38.473 as contribution [11].**

**Proposal 14: Add “bear mapping” in step 5 in 8.19.1 Remote UE initial access procedure in TS 38.401.**

**Proposal 15: Remove “ or U2N Relay UE” in “If the *PC5 RLC Channel To Be Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, act as specified in TS 38.401 [4]. GNB-DU generates the PC5 RLC channel configurations for a L2 U2N Remote UE or U2N Relay UE.” in TS 38.473.**

**Work split of the CRs:**

Considering the contribution and discussion progress, moderator allocates the CRs as following. Companies who are responsible for the CRs, please prepare the draft Tdoc based on the proposals and upload the draft CRs in folder.

- TS 38.413   ZTE

- TS 38.423   Ericssion

- TS 38.473   Huawei

- TS 38.401   CATT

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**Phase I proposals:**

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**Proposal 4: Include sl-RLC-ChannelToAddModList in DU to CU RRC Information IE.**

**Proposal 5: The explanation of maxnoofPC5RLCChannels is per remote UE or per relay UE.**

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**A: change undefined timer to T420 [11]**

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**E: Add procedure description of “5G ProSe Authorized”, “5G ProSe UE PC5 Aggregate Maximum Bit Rate”, “5G ProSe PC5 Link Aggregate Bit Rate” [4]**

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**Proposal 9: Remove Uu RLC channel related description and bear mapping in UE context setup procedure in TS 38.473 as in contribution [2].**

**Note: The moderator made the proposal following a large majority view, although some of them have not been achieved full consensus.**

**Open points：**

1. **The value of maxnoofPC5RLCChannels**
2. **Semantic description of Sidelink Configuration Container**
3. **Whether the flowchart should be changed by terminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13?**
4. **Size of Uu RLC Channel ID to align with RAN2?**

# Discussion - Phase II

##  Further check of the proposals

**Proposal 1:Keep the tabular as it and update ASN.1 to avoid the misalignment in TS 38.413 and TS 38.423.**

**Proposal 2: Update ASN.1 as following**

{ ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }

**Proposal 3: Keep existing IE for SL-PathSwitchConfig.**

**Proposal 4: Include sl-RLC-ChannelToAddModList in DU to CU RRC Information IE.**

**Proposal 5 : The explanation of maxnoofPC5RLCChannels is per remote UE or per relay UE.**

**Proposal 6: Agree the following corrections (A,C,E,F)**

**A: change undefined timer to T420 [11]**

**C: Change “Uu RLC channel” and “PC5 RLC channel” to “Uu Relay RLC channel” and “PC5 Relay RLC channel” [4] [10]**

**E: Add procedure description of “5G ProSe Authorized”, “5G ProSe UE PC5 Aggregate Maximum Bit Rate”, “5G ProSe PC5 Link Aggregate Bit Rate” [4]**

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**Proposal 9: Remove Uu RLC channel related description and bear mapping in UE context setup procedure in TS 38.473 as in contribution [2].**

If any comment for proposals of phase I, please list it here, otherwise, no feedback is needed.

|  |  |
| --- | --- |
| Samsung  | P7  |
| ZTE | P9 |
| E/// | P9, P1, 2 |
|  |  |
|  |  |

##  Value of maxnoofPC5RLCChannels

With the progress in phase I, majority companies support the explanation of maxnoofPC5RLCChannels is per remote UE or per relay UE. We further discuss the value of maxnoofPC5RLCChannels. Many companies clarified the value should be 512 as in TS 38.331.

**Question 1: Do you agree the maxnoofPC5RLCChannels should be 512?**

|  |  |
| --- | --- |
| CATT | Yes |
| Samsung  | Yes  |
| ZTE | Yes |
| CMCC | Yes |
| E/// | Yes |
| Nokia | Yes |

All companies agree the maxnoofPC5RLCChannels should be 512.

**Proposal 10: *maxnoofPC5RLCChannels* value in TS 38.473 should be 512.**

##  Sidelink Configuration Container IE

No agreement has been achieved for the following change for TS 38.473 in phase I. we continue the discussion. Moderator copy the change here:

#### 9.3.1.264 Sidelink Relay Configuration

This IE provides information of a U2N Remote UE when accessing the network via a U2N Relay UE.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| gNB-DU UE F1AP ID of Relay UE | M |  | gNB-DU UE F1AP ID9.3.1.5 |  |
| Remote UE Local ID  | M |  | 9.3.1.267 |  |
| Sidelink Configuration Container | O |  | OCTET STRING | sl-ConfigDedicatedNR-r17 IE as defined in subclause 6.3.5 in TS 38.331 [8] to carry PC5 Relay RLC channel configuration and *sl-PHY-MAC-RLC-Config*  for remote UE’s SRB1. |

**Question 2: Do company agree the change for semantic description of Sidelink Configuration Container in contribution [11]?**

|  |  |
| --- | --- |
| CATT | YesSL-RLC-ChannelToReleaseList only include SL-RLC-ChannelID-r17 which is generated by CU. |
| Samsung  | Yes This is aligned with RAN2 spec., i.e.,

|  |
| --- |
| ***sl-ConfigDedicatedNR***The network configures only the PC5 Relay RLC channel and *sl-PHY-MAC-RLC-Config* for the SRB1. |

 One question to group: which RRC IE should be referred to (sl-ConfigDedicatedNR-r17 vs. SL-ConfigDedicatedNR-r16)? The following is the RRC information structure:RRCSetup-v1700-IEs ::= SEQUENCE { sl-ConfigDedicatedNR-r17 SetupRelease {SL-ConfigDedicatedNR-r16 } OPTIONAL, -- Cond L2RemoteUE sl-L2RemoteUEConfig-r17 SetupRelease {SL-L2RemoteUEConfig-r17 } OPTIONAL, -- Cond L2RemoteUE nonCriticalExtension SEQUENCE {} OPTIONAL} |
| ZTE | Yes |
| CMCC | Yes |
| E/// | Thanks for companies’ further clarification on to release list. It is fine for us. |
| Nokia | Yes |

All companies agree change for semantic description of Sidelink Configuration Container in contribution [11].

**Proposal 11: Change semantic description of Sidelink Configuration Container in TS 38.473 as contribution [11].**

##  Flow chart alignment in TS 38.401

With progress in phase I, we conclude that those steps (step 30/24/20 for SRBs and DRB and step 15/13/13 for SRB1) in TS 38.401 is for relay UE only. We need to further confirm whether the flowchart should be changed by terminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13?

**Question 3: Whether the flowchart should be changed by terminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13?**

|  |  |
| --- | --- |
| CATT | Yes |
| Samsung  | Yes |
| ZTE | Yes |
| CMCC | Yes |
| E/// | Yes |
| Nokia | Yes |

All companies agree change the flowchart byterminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13 in TS 38.401.

**Proposal 12: Change the flowchart by terminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13 in TS 38.401.**

##  Uu RLC channel ID

This issue has not be discussed in phase I.

Contribution [11] suggests the following change to align the range of Uu/PC5 RLC CH ID with RAN2.

9.3.1.266 Uu RLC Channel ID

This IE uniquely identifies a Uu RLC channel for a L2 U2N Relay UE.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Uu RLC Channel ID | M |  | BIT STRING (SIZE (16))  |  |

**Question 4: Do companies agree the change for range of Uu/PC5 RLC CH ID ?**

|  |  |
| --- | --- |
| CATT | Yes |
| Samsung  | Yes  |
| ZTE | Yes |
| CMCC | Yes |
| E/// | Yes |
| Nokia | Yes |

All companies agree the change for range of Uu/PC5 RLC CH ID as contribution [11].

**Proposal 13: Change the range of Uu/PC5 RLC CH ID in TS 38.473 as contribution [11].**

3.6 Other corrections of 38.401

In R3-223223, DU is configured bear mapping (RB to Uu RLC channel) for relaying e.g., RRCsetup/RRCsetupcomplete of remote UE.

Q5: Add “bear mapping” in step 5 in 8.19.1 Remote UE initial access

|  |  |
| --- | --- |
| CATT | Yes |
| Samsung  | Yes  |
| ZTE | NO. The second sentence means the REQUEST message (CU sends to DU, including bearer mapping) requests the DU to provide relevant configurations for establishment of Uu RLC channels.Bearer mapping is not provided by DU and should not be added here. 5. The gNB-CU sends the UE CONTEXT MODIFICATION REQUEST message of the U2N Relay UE to gNB-DU. Such message may request the establishment of Uu RLC channel(s) and bearer mapping for the transmission of U2N Remote UE’s SRB0/1. |
| CMCC | Yes |
| E/// | No strong view |
| Nokia | Yes. The word “if not configured yet” at the end should not be deleted.  |

4 companies agree to add “bear mapping” in step 5 in 8.19.1 Remote UE initial access procedure. 1 company disagree. 1 company has no strong view for it. Moderator suggest to follow majority.

**Proposal 14: Add “bear mapping” in step 5 in 8.19.1 Remote UE initial access procedure in TS 38.401.**

3.7 Other corrections of 38.473

In R3-223224, it said that the gNB-DU cannot generate PC5 RLC channel configurations in UE context setup procedure of relay UE.

Q6: Remove “ or U2N Relay UE” in “If the *PC5 RLC Channel To Be Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, act as specified in TS 38.401 [4]. GNB-DU generates the PC5 RLC channel configurations for a L2 U2N Remote UE or U2N Relay UE.”

|  |  |
| --- | --- |
| CATT | Yes |
| Samsung  | Maybe no. When setting up PC5 RLC channel for U2N Relay UE, the remote UE ID is not used as indicated by the semantic “This IE is not used in this version of the specification.”. It seems that there is no problem of current specification.  |
| ZTE | Yes |
| CMCC | Yes |
| E/// | Yes |
| Nokia | Yes |

5 companies agree the change in Q6, and 1company disagree it. Moderator suggest to follow majority.

**Proposal 15: Remove “ or U2N Relay UE” in “If the *PC5 RLC Channel To Be Setup List* IE is contained in the UE CONTEXT SETUP REQUEST message, the gNB-DU shall, if supported, act as specified in TS 38.401 [4]. GNB-DU generates the PC5 RLC channel configurations for a L2 U2N Remote UE or U2N Relay UE.” in TS 38.473.**

## Work split of the CRs

Considering the contribution and discussion progress, moderator allocates the CRs as following. Companies who responsible for the CRs,  please prepare the draft Tdoc based on the proposals and upload the draft CRs in folder.

- TS 38.413   ZTE

- TS 38.423   Ericssion

- TS 38.473   Huawei

- TS 38.401   CATT

# Discussion -Phase I

##  Correction for TS 38.413 and TS 38.423

###  ASN.1 and tabular misalignment issue

Contribution [5] and [6] point out the misalignment between ASN.1 and tabular and suggest define a new IE instead of referencing to IE “NR UE Sidelink Aggregate Maximum Bit Rate” 9.3.1.148 to avoid that misalignment.

**Question 1: Do companies support to define a new IE for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE as [5] and [6]?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | Yes. |
| ZTE | For 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE, the ASN.1 and tabular keep alignment in TS 38.473. To resolve the misalignment issue in TS 38.413/423, the simplest way is to follow TS 38.473, i.e. change the name to refer to NR UE SL AMBR and remove the FiveG-ProSeUEPC5AggregateMaximumBitrate IE in ASN.1. { ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }  |
| Huawei | Technically, referring to the IE NR UE sidelink *Aggregate Maximum Bit Rate* or introducing a new IE for *5G ProSe* are both fine. The latter option can be clearer. For this issue, we can follow the majority. |
| E/// | In the previous discussion, companies accepted the way that legacy IE is referred in the tabular, and new set of IEs are defined in ASN.1. Following that, what should be aligned is F1AP, not XnAP and NGAP. In our contribution R3-223417 being covered by CB#SR2, we propose to update ASN.1 with new IE to keep consistent with other specs. { ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE FiveG-ProSeUEPC5AggregateMaximumBitrate PRESENCE optional }| |
| CATT | Same understanding as ZTE. Keep tabular as it and update Asn.1.  |
| ChinaTelecom | Agree with ZTE. |
| CMCC | We are fine with both solution.  |
|  |  |

For Q1, 4 companies (ZTE, E///, CATT,CTC) prefer keeping tabular as it and update ASN.1. 1 companies (Nokia) prefer introducing a new IE in the tabular; 2 companies (HW, CMCC) are fine with both option.

There are two ways to keep the tabular as it and update ASN.1,

1. TS 38.413/TS 38.423 to follow 38.473 (ZTE, CATT,CTC)
2. TS 38.473 to follow TS 38.413/TS 38.423 (Ericsson)

Since both ways work, it is not a big technical issue, the moderator propose the proposal following the majority

**Proposal 1:Keep tabular as it and update ASN.1 to avoid the misalignment in TS 38.413 and TS 38.423.**

**Proposal 2: Update ASN.1 as following**

{ ID id-FiveG-ProSeUEPC5AggregateMaximumBitrate CRITICALITY ignore TYPE NRUESidelinkAggregateMaximumBitrate PRESENCE optional }

###  Editorial corrections

There are still some editorial and minor corrections proposed in [3] and [9], we will not discuss these editorial corrections on by one, but **those corrections can be taken into account when we work on the CRs in phase2.**

## Correction for TS 38.473

### SL-PathSwitchConfig

As described in contribution [7], there are two explicit IEs, i.e., Target Relay UE ID, and Txxxx (should be T420 as defined in TS 38.331) in the Path Switch Configuration and they have been defined as SL-PathSwitchConfig in TS 38.331. Contribution [7] thinks that such information can be directly transferred from the gNB-CU to gNB-DU then to the UE in the RRC container instead of explicit signaling over F1. The corresponding change is adding a container pointing to SL-PathSwitchConfig,and remove the Target Relay UE ID and Txxxx IEs.

**Question 2: Do companies agree to add a container pointing to SL-PathSwitchConfig in Path Switch Configuration IE?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | what is the issue for current spec?  |
| ZTE | Use a container seems more clean. We are fine with majority view. |
| Huawei | For simplicity we prefer to keep existing IE. The SL-PathSwitchConfig can already be contained in the CU to DU RRC Information IE of UE CONTEXT SRTUP REQUEST message and UE CONTEXT MODIFICATION REQUEST message (CU to DU RRC Information -> CellGroupConfig -> SL-PathSwitchConfig) so one option is even to not include the container in Path Switch Configuration IE and instead refer to the container in CU to DU information. But the Remote UE Local ID is still needed and the presence of Path Switch Configuration IE is connected with procedural text so this IE is still needed.  |
| E/// | According to Huawei’s comments, we think it would be one more reason to remove these two IEs and change to container. There are two ways, either remove the existing ones, i.e., Target Relay UE ID and T420, considering they have been covered by CU to DU RRC Information, or replace as proposed in [7].  |
| CATT | Prefer to keep existing IE.The timer is generated by CU, CU further send it to DU. DU uses it to generate SL-PathSwitchConfig (SL-PathSwitchConfig contained in CellGroupConfig so it is generated by DU) and send back to CU for further RRC message. Hence DU should receive timer explicitly.  |
| China Telecom | No strong view. Agree to follow the majority. |
| CMCC | No strong view. |
| Samsung  | No. We prefer to keeping the current IEWe don’t understand Huawei’s comment that SL-PathSwitchConfig is already contained in CU to DU RRC Information. In our opinion, the gNB-DU needs to know which relay UE is connected by the remote UE during path switch, and the corresponding cell. This can help gNB-DU perform the admission control to the remote UE w.r.t. the connected relay UE. This case is similar to handover case, where the gNB-DU needs to know the target Cell. In this sense, we prefer to not having such change.  |

3 companies ( HW, CATT, Samsung) prefer to keep existing IE; 1 company ( E/// )company agree to add a container; 3 companies (ZTE, CTC, CMCC ) follow majority view.

**Proposal 3: Keep existing IE in Path Switch Configuration IE and not to add a container pointing to SL-PathSwitchConfig.**

###  PC5 low layer configuration IE

As mentioned in contribution [11], according to TS38.331, the sidelink configuration is provided by sl-ConfigDedicatedNR-r17 IE, which contains:



The highlighted part is referring to lower layer configuration provided by gNB-DU. However, currently, the gNB-DU only provides the SL-PHY-MAC-RLC-Config IE. Contribution [11] suggests adding PC5 low layer configuration IE in DU to CU RRC Information IE.

**Question 3: Do companies agree to add PC5 low layer configuration IE in DU to CU RRC Information IE?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | agree |
| ZTE | Agree that gNB-DU shall provide sl-RLC-ChannelToAddModList to gNB-CU, which is missing in the current spec.But for sl-DiscConfig which includes thresholds for discovery for Remote/Relay UE is not provided by gNB-DU but configured by CU as previous agreements. If the intention is for the dedicated resource pool for discovery, it is included in SL-PHY-MAC-RLC-Config IE (SL-PHY-MAC-RLC-Config -> sl-FreqInfoToAddModList -> sl-BWP-ToAddModList -> sl-BWP-DiscPoolConfig). Therefore, we think only PC5 RLC Channel Configuration (including sl-RLC-ChannelToAddModList) needs to add in DU to CU RRC Information IE.* gNB-CU’s responsibility:
	+ Local Remote UE ID allocation
	+ Remote UE and relay UE association and context maintenance
	+ Remote UE bearer mapping and multiplexing
	+ Relaying Uu/PC5 RLC channel management
	+ E2E QoS split management for relaying
	+ Dedicated thresholds for relay discovery
* gNB-DU’s responsibility
	+ Uu adaptation layer (AL) support for CP/UP data
	+ Determine the RLC/MAC/PHY Configuration for the relaying Uu/PC5 RLC CHs of relay UE
	+ Dedicated resource pool for NR ProSe service (same as legacy)

SL-DiscConfig-r17::= SEQUENCE { sl-RelayUE-Config-r17 SetupRelease { SL-RelayUE-Config-r17} OPTIONAL, -- L2RelayUE sl-RemoteUE-Config-r17 SetupRelease { SL-RemoteUE-Config-r17} OPTIONAL -- L2RemoteUE}SL-RelayUE-Config-r17::= SEQUENCE { threshHighRelay-r17 RSRP-Range OPTIONAL, -- Need R threshLowRelay-r17 RSRP-Range OPTIONAL, -- Need R hystMaxRelay-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRelay hystMinRelay-r17 Hysteresis OPTIONAL -- Cond ThreshLowRelay}SL-RemoteUE-Config-r17::= SEQUENCE { threshHighRemote-r17 RSRP-Range OPTIONAL, -- Need R hystMaxRemote-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRemote sl-ReselectionConfig-r17 SL-ReselectionConfig-r17 OPTIONAL -- Need R}SL-ReselectionConfig-r17::= SEQUENCE { sl-RSRP-Thresh-r17 SL-RSRP-Range-r16 OPTIONAL, -- Need R sl-FilterCoefficient-RSRP-r17 FilterCoefficient OPTIONAL, -- Need R sl-HystMin-r17 Hysteresis OPTIONAL -- Need R} |
| Huawei | Not all configurations in sl-ConfigDedicatedNR-r17 are determined by gNB-DU. In RAN3, we have agreed that gNB-CU is responsibe for the dedicated thresholds determination for relay discovery and the Uu/PC5 RLC channel management. In RAN2, sl-DiscConfig-r17 defines the Uu RSRP threshold configured by the network, which is used for relay UE or Remote UE’s discovery operation. Therefore, it should be determined by gNB-CU.sl-RLC-ChannelToAddModList-r17 provides the SL RLC bearer configuration information for PC5 Relay RLC channel between L2 U2N Relay UE and L2 U2N Remote UE, which include the RLC channel ID and some lower layer configurations. RLC channel ID is indicated by the gNB-CU, and gNB-DU generates the configurations according to gNB-CU’s indication. Therefore, sl-RLC-ChannelToAddModList-r17 can be included in DU to CU RRC Information IE. It seems RAN2 is still discussing the detailed IE and the structure. One thing that is important to remember for us in RAN3 is that it is always easier from compatibility point of view to add IEs rather than delete or change. So if we agree on something now, we need to have the understanding that we may need to revise these IEs in the future (maybe in a NBC way). |
| E/// | For discovery config, there is no need to transfer to CU since it is only used between remote UE and relay UE.For RLC Channel to add/mod list, it can be useful for the CU during mapping.One question why RLC Channel to release list is not sent from DU to CU then? |
| CATT | sl-RLC-ChannelToAddModList is sent from DU to CU, while sl-DiscConfig is generated by CU. sl-RLC-ChannelToAddModList only include SL-RLC-ChannelID-r17 which is generated by CU.Hence sl-RLC-ChannelToAddModList and sl-PHY-MAC-RLC-Config can be included in Sidelink configuration container. |
| China Telecom | Agree to include sl-RLC-ChannelToAddModList-r17 in DU to CU RRC Information IE, sl-DiscConfig is determined by CU. |
| CMCC | We share same view as ZTE, only PC5 RLC Channel Configuration needs to be added in DU to CU RRC Information IE. |
| Samsung  | We are fine to only include sl-RLC-ChannelToAddModList-r17 in DU to CU RRC Information IE. |

Companies clarify that sl-DiscConfig is not provided by gNB-DU but configured by CU and majority companies agree to include sl-RLC-ChannelToAddModList in DU to CU RRC Information IE.

**Proposal 4: Include sl-RLC-ChannelToAddModList in DU to CU RRC Information IE.**

###  maxnoofPC5RLCchannels

Contribution [4] [10] mention the explanation of maxnoofPC5RLCChannels in 9.2.2.7, three options are listed as following,

A: Maximum no. of SL RLC bearers allowed for L2 U2N relaying per Relay UE, [10]

B: Maximum no. of PC5 Relay RLC channels allowed for L2 U2N relaying per Remote UE or per Relay UE, [4]

C: No change

**Question 4: which option above is your preference?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | Prefer B.  |
| ZTE | 1. After further thinking, we think the maxnoofPC5RLCChannels shall be in the scope of Relay UE, which is used to count the total number of PC5 RLC channels across multiple Remote UEs connected to one Relay UE. While the PC5 RLC channel ID shall be per remote UE.

The value of maxnoofPC5RLCChannels shall be (no. Of PC5 RLC channel per Remote UE) \* (max no. Of Remote UE), i.e. 64 \* 256 = 16384.However, if maxnoofPC5RLCChannels supports both per Remote UE and per Relay UE, there may need two different values of maxnoofPC5RLCChannels (or two IE names to differentiate) for Remote UE and Relay UE respectively. For example, if maxnoofPC5RLCChannels is per Remote UE, the maxnoofPC5RLCChannels = 64. If it is per Relay UE, maxnoofPC5RLCChannels = 16384. This may lead more spec impacts.While if maxnoofPC5RLCChannels supports both per Remote UE and per Relay UE and maxnoofPC5RLCChannels = 64, it means Relay UE may serve at most 64 Remote UEs with only one PC5 RLC channel towards each Remote UE. It is not aligned with RAN2, i.e. Remote UE local ID is 8bits. |
| Huawei | The maximum number of PC5 RLC channel is currently 512 in 38.331. The range of remote UE ID is 256. Hence, we could assume that the of PC5 RLC channel ID is unique per relay.  Therefore, we would like to revise our proposal for ranges and suggest that:* The maximum number of PC5 RLC channel is 512.
* The range of PC5 RLC channel ID is 1..512

Then for the definition, the range is for both, so either we * change to remote or relay or
* we just simply say per UE
 |
| E/// | B |
| CATT | Per remote UE. maxnoofPC5RLCChannels=512 |
| China Telecom | Prefer B.  |
| CMCC | Option B. |
| Samsung | Option B |

5 companies (Nokia, E///, CTC, CMCC, HW[with revise]) think it is per remote UE or per relay UE; 1 company (CATT) thinks it is per remote UE; 1 company (ZTE) thinks it is per relay UE.

It should be noted, the definition of explanation of maxnoofPC5RLCChannels is also related to the value as Q5.B. Moderator suggest we can continue the discussion on the values in phase 2.

**Proposal 5 : The definition of maxnoofPC5RLCChannels is per remote UE or per relay UE.**

**Open issue 1: the value of maxnoofPC5RLCChannels.**

###  Miscellaneous corrections

Contribution [2] [4] [10][11] indicate some changes to align with other specifications. We list those changes as following:

A: change undefined timer to T420 [11]

B: change maxnoofPC5RLCChannels to 64 [2] [4]

C: Change “Uu RLC channel” and “PC5 RLC channel” to “Uu Relay RLC channel” and “PC5 Relay RLC channel” [4] [10]

D: the semantics of *Sidelink Configuration Container* IE should refer to sl-ConfigDedicatedNR-r17 IE [11]

E: Add procedure description of “5G ProSe Authorized”, “5G ProSe UE PC5 Aggregate Maximum Bit Rate”, “5G ProSe PC5 Link Aggregate Bit Rate”. [4]

F: Add procedure description of “Updated Remote UE Local ID”.[4]

G: Remove Uu RLC channel related description and bear mapping in UE context setup procedure. [2]

*NOTE: For G, moderator think it is related to question 8 and will discuss it in question 8-2.*

**Question 5: Do companies agree the above changes?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | Agree with all. |
| ZTE | A, C, D, E, F are agreeable.B is related to the conclusion of Question-4. As comment in Q4, we think the value of maxnoofPC5RLCChannels is 16384, i.e. no need to change in tabular. But the ASN.1 shall be changed to keep align.For G, as moderator point out, it is related to Question 8-2. As our comments in Q 8-2, we think the change is not necessary. |
| Huawei | A: OKB: see comments in Q4C: OK, to align the terminologyD: See comments in Q3 - not all configurations are determined by gNB-DU. E: OKF: OKG: OK. |
| E/// | A is not needed once Q2 is agreed, since T420 is previously defined as Txxxx and will be included in the container.B is incorrect, the max number of PC5 RLC channels should be 512 as defined in TS 38.331, i.e., *SL-RLC-ChannelID.*C okD seems ok, the info in the container is used by CU to configure the UE.E, F, G ok  |
|  | Agree: A,C,E,F,G B. see Q4.D. see Q3. |
| China Telecom | Agree A, C, E, F, G.B: See comments in Q4.D: See comments in Q3. |
| CMCC | A, C, E, F: agreeB,D: follow the discussion result of Q4/Q3 |
| Samsung  | A, C, D, E, F: OK B: it should be 512 as RAN2 spec. For D, we would clarify that this semantic is for the container used in INITIAL UL RRC MESSAGE. So, we don’t need link it to Q3. In the semantics, we indicates as follows:“sl-ConfigDedicatedNR-r17 IE as defined in subclause 6.3.5 in TS 38.331 [8] to carry PC5 Relay RLC channel configuration and *sl-PHY-MAC-RLC-Config*  for remote UE’s SRB1.” |

All companies think A, C, E, F is OK.

For B, we can discussed in phase 2 with the conclusion for Q4.

For D, 4 companies (Nokia, ZTE, E//, Samsung) think the correction is fine; other 4 companies ( HW, CATT, CTC,CMCC) think it up to the Q3.

For G, we will summary it in Q8-2.

**Proposal 6: Agree the following corrections (A,C,E,F)**

A: change undefined timer to T420 [11]

C: Change “Uu RLC channel” and “PC5 RLC channel” to “Uu Relay RLC channel” and “PC5 Relay RLC channel” [4] [10]

E: Add procedure description of “5G ProSe Authorized”, “5G ProSe UE PC5 Aggregate Maximum Bit Rate”, “5G ProSe PC5 Link Aggregate Bit Rate”. [4]

F: Add procedure description of “Updated Remote UE Local ID” [4]

**Open issue 2: Semantic description of Sidelink Configuration Container**

###  Editorial corrections

There are still some editorial and minor corrections proposed in [2] [4] [7] [10] and [11], we will not discuss these editorial corrections on by one, but **those corrections can be taken into account when we work on the CRs in phase2.**

##  Correction for TS 38.401

###  Configuration of PC5/uu RLC channel

Contribution [9] clarifies that the bearer mapping configurations for Relay UE and Remote UE are different. The bearer mapping for Relay UE are between U2N Remote UE’s DRB/SRB(s) and PC5/Uu Relay RLC channel(s), while the bearer mapping for Remote UE are between U2N Remote UE’s DRB/SRB(s) and PC5 Relay RLC channel(s). The working procedures for Remote UE in TS 38.401, such as step 30 in clause 8.19.1 and step 24 in clause 8.19.2, step 20 in clause 8.19.3 are not correct. Contribution [1] understands those 3 working procedures is for relay UE only and remove remote UE related description.

**Question 6-1:** **Do companies agree that those 3 procedures are for both relay UE and remote UE?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | Agree that the bearer mapping is different for Relay and Remote. But 38.401 is RAN3 spec, and should focus on RAN3 related mapping configuration. So Prefer contribution [1]. |
| ZTE | As point out in [1], the configuration of PC5 RLC channels and bearer mapping for the transmission of U2N Remote UE’s SRB2 and DRBs is performed at step 25/26. Thus, step 30 could only performed for Relay UE. An additional step could be added for add/mod/release of PC5/Uu RLC channels if necessary. Generally, these 3 steps for both relay/remote UE or only for relay UE are OK. We slightly prefer the changes for the 3 steps in [1]. |
| Huawei | agree |
| E/// | Also prefer to keep the changes within RAN3’s aspects. Suggest going for [1]. |
| CATT | [1]. Those three procedures are for relay UE only. |
| China Telecom | Prefer [1]. |
| CMCC | Agree |
| Samsung  | The changes in [1] are fine to us. Meanwhile, the figure should be changed by terminating the step at relay UE rather than remote UE.  |

**Question 6-2: If your answer is Yes for Q 6-1, do you agree the changes for the 3 procedures in contribution [9]?**

|  |  |
| --- | --- |
| Company | Comments |
| ZTE | As our comments in Q 6-1, we slightly prefer the changes for the 3 steps in [1]. |
| Huawei | agree |
| CMCC | Agree |
|  |  |
|  |  |
|  |  |

6 companies (Nokia, ZTE, E///, CATT, CTC, Samsung) prefer the change in contribution [1]; 2 companies (HW, CMCC) think those 3 procedures is for both relay UE and remote UE. in addition, 1 company (Samsung) suggests that the flowchart should be changed by terminating the step at relay UE rather than remote UE.

Moderator suggests follow majority view for Q6-1, and change in contribution [1] can be used as baseline for CR preparation. Further discussion can be performed in phase2 on whether the flowchart should be changed by terminating the step at relay UE rather than remote UE.

**Proposal 7: Taking the changes for step 30 in clause 8.19.1 and step 24 in clause 8.19.2, step 20 in clause 8.19.3 in contribution [1] as baseline for CR preparation.**

Contribution [12] indicates that Step15 in 8.19.1 is used to prepare PC5 and uu RLC channel for SRB1. uu RLC channel is for Relay UE only and PC5 RLC channel is for both Remote UE and Relay UE. So, step15 should include the Remote UE behaviour, which is align with preparation of PC5 and uu RLC channel for DRBs and SRBs in step 30. For the above reasons, contribution [12] recommends adding Remote UE related description in step 15 in 8.19.1, step 13 in 8.19.2 and step 13 in 8.19.3 and removing NOTE about earlier performed fore step 15/13/13.

**Question 7-1: Do companies agree to add** **Remote UE related description in step 15 in 8.19.1, step 13 in 8.19.2 and step 13 in 8.19.3?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | agree |
| ZTE | For Remote UE, the PC5 RLC channel configuration for SRB1 is in step 14, so step 15 is only for Relay UE and no need to add remote UE related description. Not understand the logic why step 15 shall be aligned with step 30. Moreover, as comments in Q6-1, we prefer step 30 is only for Relay UE. Based on previous agreements, the configuration of Uu RLC channel for SRB1 at relay UE might be performed in relay UE initial context setup, so the NOTE shall be kept as it is. |
| Huawei | Step 15 in 8.19.1 is dedicated for Relay UE. It can be described in bullet 13 if needed.  |
| E/// | Fine with the changes. Small comment on “Relay UE/Remote UE”, better change to “Relay UE and/or Remote UE”. |
| CATT | Step 15 is for relay UE only. NOTE 1 is needed. The RRC reconfiguration of relay UE after receiving SUI can be used for prepare PC5 and Uu RLC channel for SRB0/1 |
| China Telecom | Step 15 is only for Relay UE.After receiving SUI message, gNB can configure the Uu/PC5 RLC channel for relay UE, so NOTE 1 should be kept. |
| CMCC  | Agree. Step 14 is described as “The gNB-DU sends the *RRCSetup* message to the U2N Remote UE via the U2N Relay UE.” , in our understanding, step 14 does not include the prepare behavior for remote UE. So, the step 15 should include remote UE description for SRB1.Moreover, step 15 is similar as step 30, both procedure is also for both remote UE and relay UE. We do not find reason to discriminate them. In addition, the flow chart for remote UE establishment procedure in TS38.300 is quoted as follow. In general, the procedures should be aligned.  |
| Samsung  | Step 15 is not for Relay UE. The configuration related to Remote UE is applied in Step 14, i.e., RRCSetup Message will contain the mapping information for remote UE.  |

**Question 7-2: If your answer is Yes for Q 7-1, do companies agree that change for step 15/13/13 in contribution [12]?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | agree |
| E/// | agree |
| CMCC | Agree |
|  |  |
|  |  |
|  |  |

3 companies (Nokia, E///,CMCC) agree the change in contribution [12]; 8 companies (ZTE,HW, CATT, CTC, Samsung) think those steps (15/13/13) is for relay UE only.

Moderator suggests following majority view. Moreover, moderator understands that issue is similar as Q6, so, whether the flowchart should be changed to terminate the step at relay UE rather than remote UE for in phase2.

**Open issue 3: Whether the flowchart should be changed by terminating the step at relay UE rather than remote UE in step 30/24/20, to align with step 15/13/13?**

### Whether to configure uu RLC channel in UE CONTEXT SETUP procedure of Relay UE

In contribution [1], it clarifies that gNB establishes Uu RLC channel for remote UE only after receives SUI. It suggests to remove “During RRC connection establishment procedure of the U2N Relay UE, gNB may configure the U2N Relay UE with Uu RLC channel(s) for relaying of U2N Remote UE’s SRB0/1” in step 3.

The conclusion may also affect F1 changes, e.g. section 3.2.4

G: Remove Uu RLC channel related description and bear mapping in UE context setup procedure. [2]

**Question 8-1 : Do companies agree the change for step 3 in contribution [1]?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | Agree with the change for Step 3 in Contribution [1].  |
| ZTE | We disagree with the reason for the change in [1]. Relay UE could be configured with Uu Relay RLC channel before serving any remote UEs, in another word, gNB is able to configure Uu relay RLC channel for relay UE before receiving SUI, i.e. only configure Uu Relay RLC channel by *cellGroupConfig* but without *sl-L2RelayUEConfig.* After receiving SUI from Relay UE, gNB further configures the Relay UE with *sl-L2RelayUEConfig,* which includes remote UE L2 ID, remote UE local ID and bearer mapping. Remote UE L2 ID is used to notify Relay UE about the remote UE that will connect with the Relay UE and to identify the bearer mapping, it has no relation to Uu RLC channel configuration.CellGroupConfig ::= SEQUENCE {cellGroupId CellGroupId,...uu-Relay-RLC-ChannelToAddModList-r17 SEQUENCE (SIZE(1..maxUu-Relay-RLC-ChannelID-r17)) OF Uu-Relay-RLC-ChannelConfig-r17 OPTIONAL, -- Need N...}Therefore, we shall stick to the previous agreement. The change in [1] is not necessary.**The UE CONTEXT SETUP REQUEST message of relay UE can be used to request the setup of Uu RLC channel(s) for SRB0/SRB1, respectively.** |
| Huawei | Agree |
| E/// | Agree with the changes |
| CATT | Agree To ZTE: if we configure *cellGroupConfig* but without *sl-L2RelayUEConfig* first during RRC connection establishment procedure of the U2N Relay UE, we cannot say we set up a Uu **relay** RLC channel. It should be a Uu RLC channel for normal UE. What is the meaning of setup a Uu RLC for a relay UE in UE context setup procedure of relay UE during remote UE initial access? |
| China Telecom | Fine in general, it can be supported in future Release. |
| CMCC | Agree |
| Samsung  | Agree  |

**Question 8-2: if your answer is Yes for 8-1, do you agree to remove Uu RLC channel related description and bear mapping in UE context setup procedure as contribution [2]?**

|  |  |
| --- | --- |
| Company | Comments |
| Nokia | Agree |
| Huawei | Agree |
| E/// | Agree |
| CATT | Agree  |
| China Telecom | Agree |
| CMCC | Agree  |
| Samsung  | Agree  |

7 Companies agree the agree the change for step 3 in contribution [1]; 1 company (ZTE) think it is not necessary. Moderator suggest follow large majority view for Q8.

**Proposal 8: Remove “During RRC connection establishment procedure of the U2N Relay UE, gNB may configure the U2N Relay UE with Uu RLC channel(s) for relaying of U2N Remote UE’s SRB0/1” in step 3 of TS 38.401 as in contribution [1].**

**Proposal 9: Remove Uu RLC channel related description and bear mapping in UE context setup procedure in TS 38.473 as in contribution [2].**

### Editorial corrections

There are still some editorial and minor corrections proposed in [1]and [9], we will not discuss these editorial corrections on by one, but **those corrections can be taken into account when we work on the CRs in phase2.**

##  Others

## If any significant issue in CRs is ignored, companies can list it here.

|  |  |
| --- | --- |
| Company | Comments |
| Samsung  | The following changes in [11] may need to be taken into account in order to align with RAN2 .9.3.1.266 Uu RLC Channel IDThis IE uniquely identifies a Uu RLC channel for a L2 U2N Relay UE.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| Uu RLC Channel ID | M |  | BIT STRING (SIZE (16))  |  |

  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Moderator will handle it in phase 2.

**Open issue 4: Size of Uu RLC Channel ID to align with RAN2**

# Conclusion, Recommendations [if needed]

[TBD]

# References

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | R3-223223 | CR on TS38.401 for Rel-17 Sidelink Relay (CATT) | CR0209r, TS 38.401 v17.0.0, Rel-17, Cat. F |
| 2 | R3-223224 | CR on TS38.473 for Rel-17 Sidelink Relay (CATT) | CR0882r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 3 | R3-223228 | Corrections on NR SL Relay for 38.413 (ZTE) | CR0793r, TS 38.413 v17.0.0, Rel-17, Cat. F |
| 4 | R3-223229 | Miscellaneous corrections on NR SL Relay for 38.473 (ZTE) | CR0883r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 5 | R3-223257 | Corrections for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE (NGAP) (Nokia, Nokia Shanghai Bell) | CR0794r, TS 38.413 v17.0.0, Rel-17, Cat. F |
| 6 | R3-223258 | Corrections for 5G ProSe UE PC5 Aggregate Maximum Bit Rate IE (XnAP) (Nokia, Nokia Shanghai Bell) | CR0793r, TS 38.423 v17.0.0, Rel-17, Cat. F |
| 7 | R3-223415 | SL Relay corrections over F1 (Ericsson) | CR0918r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 8 | R3-223416 | phase-2 corrections for SL Relay (Ericsson) | draftCR |
| 9 | R3-223485 | Corrections to SL relay (Huawei) | CR0219r, TS 38.401 v17.0.0, Rel-17, Cat. F |
| 10 | R3-223486 | Corrections for SL relay (Huawei) | CR0930r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 11 | R3-223545 | Correction on Rel-17 sidelink relay (F1AP) (Samsung) | CR0941r, TS 38.473 v17.0.0, Rel-17, Cat. F |
| 12 | R3-223653 | CR to TS38.401 on R17 Sidelink Relay (CMCC) | CR0230r, TS 38.401 v17.0.0, Rel-17, Cat. F |